1:Seligmann & Seligmann E-5 (1907-1908) 1911
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CHAPTER XVI

THE SENSES OF THE VEDDAS

THE extraordinary skill displayed by the Veddas in discovering game and honey led us to test their senses as far as the time at our disposal would allow. Before recording the results of these tests in detail we may state the impression produced by certain incidents of our intercourse with the Veddas. We several times had Vedda guides and invariably noticed that, however difficult the ground, they walked quickly and noiselessly without apparently paying any attention to their footsteps. Nor did they ever seem even momentarily at a loss as to the direction to take in order to reach any part of their territory, in spite of the absence of obvious tracks. We do not think that they depended to any considerable extent on the sun; indeed, the conditions under which our most striking experience of this kind took place puts that out of the question. We left our camp at Sitala Wanniya early one morning with Handuna and his son-in-law Kaira to walk to a cave which proved to be about four miles distant. Our course lay through dense jungle, it rained intermittently and the glimpses of the sky which we obtained showed that it was completely overcast during the whole of the time. There was no sign of a track, and except once for about a couple of hundred yards we did not follow any stream though we crossed several. Nevertheless Handuna led us at a rapid walk straight up to the rock shelter which was our destination. This faculty is shared by another people inhabiting Ceylon, the Wanniya, the inhabitants of the Wanni, a large forest tract in the North Central Province. The life led by these hunters in some respects resembles that of the

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[481]
[A 395]

1;Seligmann & Seligmann 2-6 (1907-1908) 1911
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Veddas, for they depend largely on game and honey for their subsistence and like the Veddas are bow-men. Mr Parker, who has spent much time in the Wanni, gives an account of a journey he made guided by Wanniya which is so interesting that we quote it at length.

"I was taken by some Wanniyas through a piece of wild pathless forest ten or eleven miles across, near Padawiya tank, at the north-eastern boundary of the North-Central Province. The jungle was dense, and the journey therefore occupied all day. Of course we were unable to proceed in a straight line, and more than once we deviated into a right-angle from our proper direction in order to avoid thorny jungle that was said to be in front of us. At about one o'clock we came to a high rock, as they had promised, on the top of which good rain water is always retained in a hollow. There we cooked and ate some food, after which we resumed our tramp. In the middle of the forest, as we were proceeding along a deer-track, one of the men drew my attention to a half-broken twig hanging at the side of the path. 'I broke that two years ago,' he said; he was then proceeding at a right-angle from the line we were taking.

"When I asked him if he never lost his way in such thick forest, full of undergrowth, he at first could not understand my meaning. After I had explained it—feeling while doing so that I was making an interesting exhibition of my ignorance—he laughed consumedly and thought it a capital joke. 'How *can* one lose it?' he said. He had never heard of such a thing before; to him it appeared to be quite impossible, apparently as much so as getting lost in an open field would be to us. 'When we look at the sun we always know which way to go,' he remarked. The men justified my confidence in their powers by emerging, just before dusk, at the very spot where I wished to arrive, many miles from the homes of any of the party. Those who had acted as guides lived some twelve miles or more away, by the nearest footpath; and the house of the man who lived nearest was five miles from the point where we left the forest. I have always thought it a very clever feat[1]."

Mr Parker's account of the jungle craft of the Wanniya is

[1] *Ancient Ceylon*, pp. 77, 78.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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so vivid and applies so thoroughly to the progress of the Veddas through the jungle that we again quote from his work.

"While engaged on a hunting expedition, these hunters [the Wanniya]...glide along in single file, avoiding every leafy twig the rustling of which might betray their presence, or if game be near holding it until the next man can take charge of it, and hand it over in the same manner to the man behind him. At such times all tread in the footprints of the first man, who when putting his foot on the ground first glides his toes along it in order to push aside any twigs or leaves that might emit a noise if crushed. Their eyes and ears are fully alert to catch the slightest sound or movement among the thick jungle around them....They hear sounds and see objects that to a person whose perception is dulled by civilisation might as well be altogether absent, so far as his power of observation is concerned. Their trained ears detect the footfall of the wild forest animals walking through the jungle at considerable distances away, and can distinguish even the species by means of the sound, which is quite inaudible to less experienced observers. If any uncertainty exists regarding it they crouch down, or kneel with one ear on the ground, and soon clear up their doubts. When they are in search of Deer or other animals with keen sight, they hide their cloth by hanging leafy twigs round their waist-string. This certainly gives them a very wild appearance, but there is no trustworthy evidence to show that it was the primitive dress of the aborigines of Ceylon.

"Wild honey being one of their favourite foods, their vision and hearing are trained to an astonishing quickness in detecting every Bee that flies across their path, and noting its species, and whether it is flying laden or is only in quest of food. When it is carrying a load of honey and flying straight through the trees, they at once move off in the same direction, if it be the season in which the hives contain honey, that is, August and September, knowing of course that the laden insect makes a direct flight to its hive—the proverbial bee-line. As the nest is approached other Bees are seen converging towards it, and in a few minutes it is certain to be discovered[1]."

[1] *Op. cit.*, pp. 70, 71.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
AX5 Vedda AX5

951 Doubtless Mr Parker is right in ascribing the marvellous jungle craft of the Wanniya to trained perception and powers of observation, for the equally fine performance of the Veddas is certainly not due to any all round superiority of the senses, as our observations on sight and hearing indicate.

Visual Acuity.

The visual acuity of twenty-four Vedda men and youths was tested by the E method described by Dr Rivers[1]. The majority of the subjects we tested quickly learnt what was required of them, though they were far less interested in this than in the colour vision tests and illusions, to which we shall refer presently.

The average distance at which a Vedda could distinguish the letter E was 14 metres, no appreciable difference being detected between the Veddas of the wildest groups (Sitala Wanniya, Henebedda) and the more sophisticated Veddas of Bandaraduwa. Giving the results on the same plan as that adopted in the second volume of the Reports of the *Expedition to Torres Straits*, 10 men (41·7 %) have a visual acuity expressed by less than 2; 12 (50 %) have an acuity between 2 and 3. The greatest distance at which E was recognised was

[1] This method is a modification of the E test devised by Cohn, "in which a letter E can be exposed in any desired position through a circular hole in a card. The subject of the test has to place a letter E which he holds in his hands in the same position as one shown to him. Instead of the small cardboard E provided in Cohn's test, I used a larger letter E pasted on a board. Cohn's method is very simple and convenient and it entirely removes the danger accompanying the older tests, that the letters may be learnt by heart during the process of testing.

"In general the procedure was the same as that previously adopted in Torres Straits; the observations were made in the open air, both eyes were used, and the distance at which a native made two mistakes in ten exposures was taken as his limit of vision. In one respect the procedure differed; with the older form of the test it was most convenient to begin with the observer beyond his far limit of vision, and to bring him up towards the test-types till he could decipher the letters. With Cohn's form of the test, I first showed the E in various positions at a short distance, and as soon as I had satisfied myself that the native understood the method of testing, I gradually increased the distance till I reached a point at which the positions of the letter could no longer be recognised." (*British Journal of Psychology*, Vol. 1, 1905, p. 323.)

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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19 metres; this occurred twice. According to the system in ordinary use the position of the letter E used is supposed to be distinguished by the normal eye at a distance of 6 metres, that is, the average sight of a Vedda would be put down as 2·33 times the normal. It is, however, well known that the results obtained are greatly influenced by the quality and nature of the light existing during the test, and comparison with the figures obtained in other countries shows that there is little difference between Veddas and other races. This was confirmed by the results of the examination of ten peasant Sinhalese whose average visual acuity was 17 metres, while if one man of distinctly subnormal vision be ignored the average acuity of the remaining nine works out at nearly 18·5 metres. The keenest sighted individual could distinguish the position of the letter E at 22 metres.

Acuity of vision as tested by the E method seems to decrease in middle life, but this although often quite well marked does not lead to any recognised diminution of hunting capacity, practice and knowledge fully making up for the physical changes in the eye.

Colour Vision.

The alleged absence of the full appreciation of colours among the Veddas was brought forward in Ceylon as a proof of their low mental capacity, but careful observations made with coloured wools and papers showed their perception of colour to be extremely acute. Forty-two adult males, 15 women and 3 boys were tested for colour blindness with a negative result. The majority of our subjects matched the wools quickly and accurately, and of those who at first made mistakes nearly all matched a wool with another of the same saturation but of a different colour. This was particularly noticeable in one old woman who picked out the wools and arranged them in heaps composed of varying colours of the same saturation.

Colour names were collected from 31 men and 4 women

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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by means of Rothe's set of colour papers and the results obtained in this way were checked by frequent reference to Holmgren's wools. When shown the coloured papers and asked the names the more sophisticated among the Veddas gave the usual Sinhalese colour names, red *ratu*; orange and yellow *kahu*; green (three shades) and blue and purple were all called *nil*; black *kalu*; white *sudu*. However few men used all the Sinhalese names, most of the men making comparison with natural objects for at least one or two of the colours, while the least sophisticated men made comparisons for all the colours. Handuna of Sitala Wanniya compared all colours to flowers and leaves except red and orange for which he gave the usual Sinhalese terms. As the flowering season had not begun at the time of our visit we were unable to test the accuracy of his comparisons with the objects themselves, therefore after the colour papers had been put away we repeated the names he had told us and asked him to pick out similar colours from the coloured wools. This he did, and we found that these matched the colour papers to which the flower names had originally been applied with extraordinary accuracy. This man and others as uncontaminated as himself distinguished the two shades of blue and the three of green of the papers, while those who had mixed more with Sinhalese applied *nil* to all shades of blue and green. In order to test whether Handuna knew the ordinary Sinhalese colour names, we gave him the bundle of wools and asked him to show us *sudu* (white), he then picked out white and the very slightly saturated colours of all shades. For *ratu* (red) he gave all the strongly saturated shades of red, purple, claret, bright pink and brown shading off to yellow; *kaha* (yellow) included yellows and a few pale pinks; *nil* (blue and green) included all strongly saturated blue and green-grey tints, violet and some dark browns; these darker shades he also said were *kalu* (black) and he compared them to the bark of trees.

It was noticed that on asking the names for the colour papers the Veddas made comparisons, likening the red paper to a red flower or saying "red like blood," while the purple paper was compared to a blue flower; the three shades of green shown would often be compared to three different kinds of

1;Seligmann & Seligmann E-5 (1907-1908) 1911
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leaves, whereas the rural Sinhalese would say *ratu* for the two first colours and *nil* for the four last.

Other comparisons frequently made by Veddas were "like *hatu*" used both for orange and black, a source of great bewilderment till it was discovered that *hatu* was a general term for fungus, a bright orange and a black species being brought to us to clear up the difficulty.

Red was compared to fire, black to the coat of a bear, pure white to coconut milk and dirty white to the wax of the *bambara*. Generally speaking it appeared that the more unsophisticated the Vedda the less he used the Sinhalese colour terms, using in their place references to familiar objects. "Like blood" was a frequent comparison, sometimes used for red and sometimes for purple. Though colours were occasionally compared to bird's feathers we did not note any compared to butterflies. When shown purple, violet and blue, most Veddas said they did not know those colours or had never seen anything like them, and one said the same of yellow.

Forty-eight rural Sinhalese were tested for colour blindness and no case was found. The coloured wools were usually matched quickly and accurately. Colour names were collected from 25 men, the usual names given were *ratu* for red and purple, *kaha* for yellow and orange, *nil* for all greens and blues and sometimes for violet and purple, *kalu* for black and also often for indigo, *sudu* for white. Other words occasionally given were *dumbutu* or *dumburu*[1] once given for black, three times for violet, once for blue and once for purple, and on one occasion when wools instead of papers were shown the same word was applied to a shade of claret. *Illalu*[2] was used once for purple, and once for violet. *Guru*[3] which means mud was given on one

[1] Mr Parker informs us "that *dumbutu* is the same as *dumburu* and means a dark reddish purple or according to Clough 'a compound of red and black' and is sometimes applied to the dark rain clouds of the evening."

[2] *Illalu* is stated in Clough's Dictionary to be applied to "a fair complexion, light red, brown."

[3] Mr Parker writes, "In Clough's Dictionary the meanings of *gurugala* are 'red chalk [Platerite], red orpiment, gold' but '*guru* colour' is applied colloquially to a purple sky." In the invocation to Pannikkia Yaka (Chapter X, No. XIV) *guru* is applied to the sky and the earth at dawn.

1;Seligmann & Seligmann E-5 (1907-1908) 1911
AX5 Vedda AX5

occasion for orange and on another for violet; *tamba* (copper) was used for violet and blue, this word was also given for the colour of our hair when it applied equally to dark and red hair. Sinhalese hair was called *kalu*. *Pachcha* was once used for yellow-green, this being a Tamil word for green.

Whereas the Veddas seemed to think of colours by a mental reference to the appearance of leaves, flowers and other natural objects, the Sinhalese far more usually made use of colour terms, and none distinguished as many shades as the Veddas except Tissahami, "the Vedda Arachi," whose keen comparisons make his observations worthy of record in full. Several Sinhalese likened red and purple to blood, and compared green with the colour of leaves. Tissahami was first shown the colour papers, for red he gave *ratu* and said it was like fire; yellow he said he did not know; bright green *nil*, blue-green *nil*, blue *kalu*, these three he compared to different kinds of creepers; purple he said he did not know; violet like the small stingless bee; black *kalu*; white *sudu*. He was so interested in looking at colours and comparing them that we showed him several other objects. The outside of a pig-skin pocket book he called *dumburu*, the cleaned and unpolished side of the leather he compared to clay. He was then shown the bundle of coloured wools which he examined at will, comparing and naming those he chose, a grey approaching violet he called *dumburu*; dark greyish-brown he said was like a certain kind of leaf; golden yellow like monkey's fat; a light yellow-brown like a spider's web; greenish-blue like the leaves of a particular kind of yam; a deep claret almost brown he compared to the bark of a tree which is chewed with areca nut and dark greyish-violet to a village potato. It seems that this man whose keen intellect we have referred to in Chapter II had retained something of the Vedda mode of thought acquired during his contact with them in his youth.

1:Seligmann & Seligmann E-S (1907-1908) 1811
AX5 Vedda AX5

VISUAL ILLUSIONS.

The Müller-Lyer Illusion. We used the improved apparatus made of thin xylonite (Fig. 15) devised by Dr Rivers. "One part of the apparatus slides in and out of a framework, on the upper surface of which is drawn one-half of the Müller-Lyer figure, while the other half is drawn on the moveable sliding portion. The lines of which the figure consists are only half a millimetre broad and the point of junction between the two parts of the figure corresponds with the line of junction between the two parts of the apparatus....

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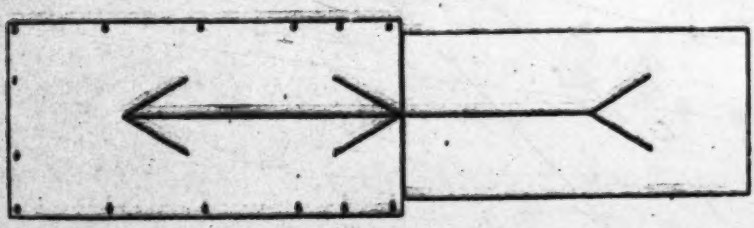

Fig. 15.

"The observer had to make five observations by sliding the moveable part in till the two lines of the figure appeared to him to be equal to one another, and then a second series of five measurements was made by drawing the sliding part outwards till the two parts again appeared equal. In the first series, the variable line was made equal to the standard by a process of shortening, in the second, by a process of lengthening the variable line[1]."

Seventeen Veddas were tested, all of whom appeared to take great interest in the matter.

The average length seen by them was 52·01 (begin long) and 52·09 (begin short). It is of interest to compare these figures with average taken from 13 Sinhalese—55·33 (begin long) and 55·7 (begin short), as well as those taken by Dr Rivers in India.

[1] *British Journal of Psychology*, Vol. 1, p. 256.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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Twenty Todas gave an average of 61·2 (begin long) and 58·4 (begin short), while 28 Uralis and Sholagas, i.e. members of jungle tribes comparable in some respects with the Veddas, gave an average of 57·2 (begin long) and 53·4 (begin short).

One Vedda, who first gave 75, i.e. did not see the illusion, afterwards gave 61·54, 51·58. The most correct measurements were given by Vela, 66, 64, 63, 74, 72, average 67·8 (begin long), and 65, 65, 67, 69, 72, average 67·6 (begin short). In many instances although the men were interested and apparently trying their best each time the results in all their five attempts showed great variations. Among the Sinhalese, on the other hand, the results from separate individuals were often remarkably constant, one man giving 58, 58, 56, 60, 59, and another 60, 56, 57, 57. The average of 16 Sinhalese gave 55·3 (begin long) and 55·7 (begin short). The averages of the mean variations (M.V.) of Veddas and Sinhalese are as follows:

Veddas		Sinhalese	
Begin long	Begin short	Begin long	Begin short
3·5	3·1	3·2	2·5

Other Illusions. A number of illusions were shown to Veddas and Sinhalese. Colour after effects were in general seen very clearly as were the parallel line illusions numbered B. 3 and B. 4 in the Milton-Bradley collection. A number of Sinhalese peasants were especially interested in these parallel lines, working out the explanation for themselves; they were also interested in the illusion numbered C. 5, consisting of two curved pieces of cardboard of the same shape and of equal size which looked of very different size when placed side by side. The general explanation of these illusions offered by the jungle-dwelling Sinhalese was that their eyes were defective. The results obtained by showing equal black and white squares on white and black grounds were by no means constant.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
AX5 Vedda AX5

TACTILE DISCRIMINATION.

The threshold for the tactile discrimination of two points was tested by the method devised by Dr W. McDougall, and used by him in Torres Straits[1]. 151●

Preliminary observations on Sinhalese in which they were told after each test whether they were right or wrong suggested that this practice led to speculation on their sensations, their subsequent answers being influenced by inference and judgment. Accordingly neither Veddas nor Sinhalese were told whether their answers were right or wrong.

The areas of skin tested were:

(1) The middle of the flexor surface of the left forearm, the points being applied in a longitudinal direction.

(2) The nape of the neck, the points being applied transversely and about equidistant from the middle line.

(3) The palm or surface of the terminal phalanx of the left index finger, the points being applied longitudinally.

Our observations which were made on 12 Veddas and the same

[1] This method has been described by Dr Rivers (*op. cit.*, pp. 363, 364) as follows: "The important feature of this method is that the area of the skin which is being tested is touched with one point just as often as with two points. If stimulations with one point are only occasionally interspersed between the stimulations with two points so that the latter are given more frequently, the results are almost certain to be biassed. If the observer either knows or thinks that he is being touched with two points more frequently than with one point, he will tend in cases of doubt, to answer 'two' more often than 'one.' The error thus introduced can only be eliminated by an absolute equality in the number of single and double stimulations.

"The compass points were applied at a distance from one another decidedly greater than the probable threshold, and the distance between them gradually diminished till the two points were no longer recognised as two. Twenty stimulations were made at each distance at which any error occurred, ten stimulations with one point, and an equal number with two points. The distance taken as the threshold is that at which two mistakes in ten occur in each kind of stimulation....

"A man who called two points 'one' twice and one point 'two' three times at a given distance would be rejected at that distance, and the distance next above it would be regarded as the threshold.

"When the skin was touched with one point only, this was applied in the neighbourhood of one or other of the spots touched in the double stimulations."

1;Seligmann & Seligmann E-5 (1907-1908) 1911
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151 number of Sinhalese showed that on the whole the tactile sensibility of the two races was equal; further no member of either race showed any great variation from his fellows.

	Forearm mm.	Nape mm.	Finger mm.
Vedda average	55	27·9	2·9
mean variation (M.V.)	5·8	11·7	0·6
Sinhalese average	50	30	2·6
mean variation (M.V.)	13	6·5	0·6

Sensibility to Pain.

The degree of sensitiveness to pain of both Veddas and Sinhalese was tested by means of the modification of Cattell's algometer used by Rivers and Head[1], which differs from the original in that the spring is extended instead of compressed. "It consists of an ebonite rod 9 mm. in diameter, with smooth, somewhat flattened hemispherical head, which slides within a large ebonite rod against the resistance of a spiral spring. The larger rod is grasped by the operator, and the end of the smaller rod applied perpendicularly to the skin and a steadily increasing pressure made until the subject cries 'Stop.' A brass pin projecting from the smaller rod pushes an index up a scale which is attached to the larger rod and graduated in kilograms. The degree of pressure exerted can then be read from the index after removing the instrument from the skin[2]." Our subjects were instructed to cry out directly they began to feel any pain, the algometer always being applied by the same observer who endeavoured to increase the pressure at a constant rate.

The areas chosen for application of the algometer were:

(i) the centre of the nails of the thumb and index of each hand;

(ii) the sternum, pressure being applied over the manubrium to corresponding spots on each side of the middle line;

(iii) above the knee, the subject being seated with the knee

[1] *A Human Experiment in Nerve Division.* Brain 1908.

[2] *Expedition to Torres Straits*, Vol. II, p. 134.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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bent at right angles and pressure being applied in the centre of the limb immediately behind the knee-cap. 151

It has been pointed out by Dr Rivers that there is danger that "some individuals might regard the experiment as a test of the power of enduring pain, and might not speak till they had experienced pain for some time and could bear it no longer[1]." We were fully alive to this, and while one observer applied the algometer the other would often watch for the slight involuntary flinching which in many of our subjects—especially in the Veddas—marked the threshold of pain. As will be seen by the figures given below the threshold was consistently lower for the Veddas than for the Sinhalese. The Veddas were undoubtedly more interested in the experiment than the Sinhalese, and the flinching accompanying the onset of pain was more frequently noted in the former than in the latter. Nevertheless we consider that the difference in the figures is not due to carelessness or misapprehension on the part of the Sinhalese, but indicates a real difference in sensibility to pain in the two peoples. Were this not the case we should expect to obtain considerable variations in the same individual in the figures given by pressure on symmetrical areas; such variations are, however, quite rare.

We tested 21 Veddas and 18 Sinhalese, with the results shown in the following table:

	Thumb		Forefinger		Sternum		Above Knee	
	R.	L.	R.	L.	1 (L.)	1 (R.)	R.	L.
Veddas (21) average	4·3	5·8	37·1	5·6	5·8	4·1	6·2	6·1
" " M.V.	·15	·09	·6	·3	·3	·1	·1	·7
Sinhalese (18) average	5·3	5·3	5	5·8	5·3	5·3	10·3	9·3
" " M.V.	1·3	·4	1·3	·6	·06	·06	·06	·4

With a single exception (the forefinger in the Sinhalese) the thresholds are higher on the right side than on the left.

[1] *British Journal of Psychology*, Vol. 1, p. 370.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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Dr Rivers' experiments upon the Todas gave the same result and led him to conclude that the threshold is slightly higher on the right than on the left side. In coming to this conclusion he took into account a set of control experiments in which the left side was first stimulated; it will be noticed in the above table that the left side of the sternum was the first stimulated[1].

SMELL.

No attempt was made to determine the olfactory acuity of the Veddas, but our experiments with scents suggested to us that this was not specially well developed. Certainly the Henebedda Veddas suffered no inconvenience from the objectionable smell which arose round the Bendiyagalge rock-shelters after a few days' occupation, nor did they seek to diminish this smell, which was due to the lack of the most elementary sanitary precaution.

The following scents were offered to a number of Veddas at Henebedda, Bandaraduwa, Godatalawa, Sitala Wanniya and Unuwatura Bubula: civet, camphor, jasmine, *peau d'Espagne*, tonquin, orris, assafoetida, peppermint, verbena, crategine, chloroform, Lin. terebinthinae aceticum (B.P.), chloral, and eau de Cologne. The men examined were Tuta of Henebedda (1), Kaira of Henebedda (2), Poromala Walaha (3), Kaira (bearded) of Henebedda (4), the Vidane of Bandaraduwa (5), Banda of Bandaraduwa (6), a number of men of Godatalawa (7), Kaira of Sitala Wanniya (8), Handuna and Nila of Sitala Wanniya (9), Naida and Appu of Unuwatura Bubula (10), Tambia (11), Banda (12).

In most cases their opinions were taken down separately, but at Unuwatura Bubula and Godatalawa the scents were passed round and the general opinion of our informants recorded. The Veddas were always interested in examining the scents, but though they said a number of the odours were good they

[1] In his paper in the *British Journal of Psychology* Dr Rivers discusses at some length the possible fallacies of the method described.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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seldom showed any emotion of pleasure: on the other hand their demonstrations of dislike were unmistakable. When a scent appeared to them particularly distasteful they invariably held their noses and cleared their throats, but we do not remember seeing them spit. It will be noticed that there is a great variation of opinion, and even such a distinct odour as civet is considered by some very pleasant and by others extremely disagreeable. Again the same simile "squeezed orange skin" was used by different men referring to such unlike scents as civet and peppermint, and while in the first instance it was considered good, in the second it was thought unpleasant. The men of Godatalawa compared camphor to the flowers of the *na* tree (*Mesua ferrea*), calling it a good scent, while Kaira of Sitala Wanniya said assafoetida was a very bad scent like *na* flowers, and assured us that he disliked the scent of the *na* flower intensely. Except such well known flowers as this and that of the *mora* tree we were unable to identify any of the flowers mentioned as they were nearly all out of season.

Civet. Good, wild boar's fat (1), good, squeezed orange skin (3), not good (4), very bad, like faeces (5); good, like burning (6); good, like a flower smell (7); bad, like *kalka* flower (8); like wax of tree *bambara* (9); good, like leopard fat (10); bad, like faeces (11); bad, like faeces (12).

Camphor. Good (1); good (3); bad, like squeezed orange (4); bad (5); good (6); very good, like smell of *na* flowers (7); good, like *koel* flower (8); good, like a kind of lime (9); good, like medicine (10); very bad (11); sour, bad (12).

Jasmine. Good smell, monkey fat (1); good, like smell of mangoes (3); like honey of *bulumal* (4); bad (5); very slight smell and not good (6); not good, like *kapumal* (? *Eriodendron anfractuosum*) (7); good, like *nimbuto* flower (8); like young oranges, good (9); bad, like pig fat (10); not good (11); doubtful (12).

Peau d'espagne. Doubtful, like betel leaves (1); good (3); good, like *moramal* honey (4); doubtful, partly good (5); too strong (6); like cocoanut spirit (7); good, like *kiula* honey (8); good, like orange (9); bad, like bear's fat (10); good (12).

Tonquin. Good, like bear's fat (1); like the fat of the monitor

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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lizard, good (4); good (5); good (6); very good, like *jak* fruit (*Artocarpus integrifolia*) (7); *malusini* fruit, good (8); like honey, good (9); bad, like bear's fat (10); good (11); bad (12).

Orris. Good, lime peel squeezed (1); good, like fat of the monitor lizard (3); not good, like squeezed orange skin (4); bad (5); like smoke (6); good, like *tuduwal* (7); bad (8); bad, like *kuwina* (edible) fruit (9); bad, like elk fat (10); bad (11); very bad (12).

Assafoetida. Bad, like bear's fat (1); good (3); bad (4); bad (5); good (6); very good, like *ghee* (7); bad, like *na* flower (8); bad, like *na* flower (9); bad (10); bad (11); bad, like sour lime (12).

Peppermint. Like wild boar's fat (1); like pepper (2); good (3); bad, like orange skin (4); like smoke (6); good, like *epolu* flowers (7); bad, like a flower (8); good, like *malusini* fruit (9); medicine like coriander (10); bad, like burning (11); too strong, bad (12).

Verbena. Good, squeezed orange skin (3); good, like the flowers of the *mora* tree (*Nephelium longana*) (4); bad (5); no smell or very little (6); very good, like smell of oil (7); good, like *naran* flowers (8); good, like skin of lime (9); like coconut-spirit, good (10); like honey (11); bad (12).

A few jungle Sinhalese showed very much the same variations in personal likes and dislikes as the Veddas, but none of these men compared the scents to the odour of particular kinds of flowers—indeed comparisons were few—though one man who disliked the smell of assafoetida extremely called this *titai*. This word was commonly applied to the sensation produced by a solution of quinine applied to the tongue[1].

[1] We may here note the results of a very few experiments on taste. The Veddas of Henebedda (we speak especially of the young men of the community) have learnt to eat curry as "hot" and as highly spiced as that favoured by the Sinhalese—i.e. a curry far "hotter" than suits the palate of a seasoned European. These men resembled the peasant Sinhalese in calling the "hot" taste produced by pepper *kata pissenawa*, i.e. mouth burning; quinine they compared to the bitter *hareenda* fruit. Sugar or anything sweet was always compared to honey by both Veddas and Sinhalese; one of the latter compared vinegar to the taste of the juice of limes.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
AXS Vedda AXS

Hearing.

We made a number of observations on acuity of hearing; owing to the different conditions prevalent on different days and in different localities, no attempt is made to compare the results obtained from Veddas of different groups. Our observations were made with Politzer's *Hörmesser*, an instrument in which a small metal hammer strikes a metal bar and so produces a constant sound, and although no general conclusions can be drawn certain of our results seem worthy of record. Eight men of Bendiyagalge were tested immediately after each other; two of these men, judged to be under twenty, heard the sound at 8 and 10 metres respectively; four more or less middle-aged men heard it at 3 to 5 metres; and two men, Poromala (Wallaha) and his brother Handuna, both of whom we judged to be over fifty, could only hear it at one metre or less. The figures obtained with the Sitala Wanniya group though less striking point in the same direction, so that we seem justified in stating that the hearing powers of the Veddas are at their maximum during or soon after adolescence, after which they soon begin to lessen and may reach a rather low level while the individual is still active and energetic, and before his capacity as a hunter is noticeably diminished. None of the older men with a low auditory acuity had given us any reason in daily intercourse to suspect that their hearing was less acute than that of their younger comrades. We several times noted the very great influence of the position of the head, and we soon allowed our subjects to stand with the head in any comfortable position in which they could not see the *Hörmesser*, which was clicked behind them as nearly as possible at right angles to a plane passing through both shoulders. Under these conditions a Vedda of Danigala, with his head turned so that his left ear was inclined towards the *Hörmesser*, could hear four out of five clicks at 16 metres, though with his head facing directly away from the *Hörmesser* he could only doubtfully hear anything at 8 metres, and could not definitely hear the sound at a greater distance than 5 metres.

1:Seligmann & Seligmann E-5 (1907-1908) 1911
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151 Our observations on Sinhalese were very limited, but led us to consider that the acuity of hearing of the peasant Sinhalese between the ages of 30 and 40 did not excel that of Europeans, for although a few individuals had a higher acuity than ourselves, the majority fell below us.

Enumeration.

802 184 This is a convenient place to refer to the question of counting. With regard to village Veddas our observations confirm the experience of others that the village Veddas have adopted the Sinhalese numerals, which they use correctly, at least up to 20, but we cannot say whether they are equally accurate when using higher numbers. This facility in counting is not found among the wilder Veddas whose method among themselves on the rare occasions on which they wish to express a definite number is to take small pieces of stick and lay them on one side saying as each stick is put down *ekamai* "that is one." Beyond this the wilder Veddas have a slight knowledge of the meaning of the Sinhalese words for the lower numbers. Handuna of Sitala Wanniya made no difficulty in picking out 2, 3, or 4 pieces of stick from a heap on being given the Sinhalese number; the Sinhalese words for 5 or 6 (though he said he knew them perfectly well) led to hesitation and sometimes to failure in picking out the correct number, while larger numbers obviously failed to convey any precise idea to him. Although we interrogated only two other elderly Veddas of the wilder groups on this matter the results we obtained from them were so like those given by Handuna that we do not hesitate to accept his behaviour as typical of the old members of the less sophisticated groups of Veddas, and in support of this view we may refer to p. 33 on which we have stated the information given on this point by a very old Sinhalese informant. We do not attribute the Vedda inability to count to any lack of intelligence but simply to their having little need to be precise in the matter of numbers[1].

[1] For further information concerning this point cf. *Ancient Ceylon*, pp. 86 and 89.

5: Spittel D-5 (ca. 1920) 1945 AX5 Vedda AX5

In their inhospitable forests, the most wild and arid in the Island, where food is scarce and only attained with great hardship, the Vedda is king. His lifelong apprenticeship to the harsh conditions fits him superbly to the mercile s task. He knows season and place and is sensitive to the slightest clue. How ill-fitted for this life are we of the towns who would starve by a tree with a honey-comb or with a succulent yam under foot. They make us feel like children, in that environment, these admirable Crichtons of the jungle, and our urban refinements as dross compared with their simple skill and hardihood.

It is truly a delight to travel with the Vedda and watch his ways. Moving silently, speaking no word except to "hum" an animal call to attract each other's attention, they allow nothing to escape them, and read the ground like a book, indicating spoor where you see nothing. Becoming sceptical of such claims I thought I would test the skill of Suthu Banda, also known as Poromola. Telling him to turn his face away, I tip-toed lightly on the bed of leaf that carpeted our path, and asked him to indicate my foot-prints.

"Here they are, and here," he said without a moment's hesitation. "Why, it's easy; don't you see the leaves turned?" (I certainly did not, demonstrate as hard as he might). "What is the difficulty for us to see a human foot-print here," he continued, "who have to follow a mouse-deer's trail on ground that shows less than this."

We had halted by a tree of great height and enormous girth, branchless for quite forty feet from the ground—as awkward a proposition for a climber as one could wish. I asked Suthu Banda whether he could climb it. "Why not," he said; and, without so much as putting down the axe hitched to his shoulder, he mounted the rock beside which the tree stood, and looked up a second or two. Then, shinning up an adjacent sapling that shot high, swung on to the slender extremity of the big tree's lowermost branch that sagged under his weight, and moved along with a carelessness painful to watch. He was soon among boughs no bigger than a man's wrist, and from the dizzy height wished to know whether we wanted him to go higher! None of your artificial aids, such as loops, for the Vedda; he is a veritable quadrumana, with feet as prehensile as hands.

They have a sure method of killing sambur. In the rainy months, and also, more rarely, in the drought, these animals climb to the tops of solitary hills. The Vedda, always watchful for the opportunity, is quick to detect this by the spoor. Cautiously attaining the summit, one or two of them guard with guns the only path by which the sambur must

Yams, chillies and melons survive a few months longer. After one to one and a half years the *chena* is abandoned as worthless, and a fresh acreage leased; for *kurrukkan* especially, is reputed to take such heavy toll of the soil, that this must be allowed to lie fallow for some ten or twelve years before being fit for recultivation! A terrible consumption of forest land results, unless controlled; harmless enough where a few families exist in vast forests; but sadly devastating in places at all populous.

Irrigation, as these people know it, is solely what heaven bestows. Water may lie to hand but is not seriously utilized. A drought brings ruin, and scatters the folk far in quest of food. It is time a more economic system of agriculture was introduced to the Vanni, and the people taught, by the institution of model *chenas*, at least the value of forest leaf mould as a manure, and the advantages of some simple system of irrigation from available streams or wells, such as the Tamils of Jaffna and the Moors of the Eastern Province exploit so well.

8: Spittel D-5 (ca. 1920) 1945 AX5 Vedda AX5

HIVES

There are five varieties of honey bee in Ceylon:—The large *bambara* (*Apis dorsata*) that builds huge combs of very pure wax on bare hill sides and the large branches of lofty trees; the *mee massa* (*Apis indica*) sweetest honey bee of all, whose combs are to be found in hollow trees, rock-clefts and within ant-hills; the *dandual massa* (*Apis florea*), the smallest honey-bee in the world, that hives on rocks and boughs; the *kanava massa* (Rosin or Dammar bee) a docile, stingless, friendly little creature whose long black combs within tree crevices yield a delicious, if heady, honey; the *kotha massa*, an even smaller species, whose puny comb is hardly worth the taking. 222 136

Kanava and *kotha* combs are available all the year round; they are the *pathinchiharayas* or stayers. If the Vedda is hungry it is for one of these he goes at a pinch. The *bambara* and *mee massa*, the most abundant honey makers, are seasonal in their habits; and June and July are the great honey months; the fruit season synchronising with this, marks these months as the festive time of the jungle; then the Veddas leave their homes for caves and stream beds, take their fill, and have a surplus for barter. 222 [439]

On the flavours of honey the Veddas are connoisseurs. They can tell by tasting a comb the flower or medley of flowers that contributed to its making. That honey is relished most which prevails when the *mora*, *veera* and *galseembela* are in bloom. [151 262]

Honey gathering is the master art of the Vedda. Supreme as he is in other jungle crafts, he is supremest in this. As he travels through the forest he is alive to the faintest hum, and no hive, however concealed, escapes him. His adroitness in tracking a bee to its lair is well described in a delightfully euphonious song they have (beginning, *Thomba, thomba Gomba me-na-na*), that tells of a Vedda Thutha who goes on the honey quest with his brothers Gomba and Naga. Thutha leads in the trail of a particular bee; and as he goes he sings to his brothers, indicating various trees in which bees are busy; but not decoyed by these, and with his eye steadily on the bee he first sighted, he follows it, till eventually it guides him to its hive within the skull of an elephant—*kolanathe gatche* (tree without leaves) as he quaintly describes. [533]

The taking of any hive, other than that of the rock *bambara*, is a very simple thing for the Vedda. All he does is to climb the tree, steady himself at the hole containing the comb, and blow into it to drive the bees away. Then with his axe he enlarges the opening sufficiently to enable him to introduce a hand and secure the cache, stopping every now and then to blow inside or to slap an offending bee. He eats the comb at his perch, grubs and all, throwing down fragments to those below.

The *bambara* comb is quite a different proposition. These great bees build high on the precipitous sides of rocks; their security lying not in their seclusion but in their inaccessibility. These hives are the prize of the bold and skilful only. A dangling cane at Westminster Abbey gave us some idea of the daring of the enterprise. To reach the combs ladders of vines are lowered from the summit of the rock; and down these the collector descends; as this does not bring him within arm's length of the hives, he has usually to rely on the use of a long stake. Sometimes [417 481]